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ABSTRACT

At the time of registration, students taking the Scholastic Assessment Tests (SAT) voluntarily complete the Student Descriptive Questionnaire (SDQ), which asks a variety of questions, one of which asks students to choose the ethnic/racial category that describes them. choosing only one category. The SAT Program undertook two studies aimed at evaluating the impact of allowing students to indicate more than one ethnic/racial category. Information was collected during 2 large fall administrations of the SAT I from 349,608 students. Students were asked, immediately following testing, to indicate their ethnic/racial background on their answer sheet, and multiple selections were allowed. During the fall administration, students were asked to indicate all categories that described them using essentially the same list found on the SDQ. During the second administration, students were asked to describe themselves using a two-part question, first indicating their ethnicity and then their race. Approximately 93% of test takers responded to the questions on both the answer sheet and the SDQ and about 4.5% moved from a single category to multiple ethnic/racial categories. The effect of the shift from a single category to multiple categories was further examined by comparing differential item functioning (DIF) results using the test takers from the first administration. Results indicate that the mean DIF changed very little when the groups were redefined using their responses on the answer sheet. These analyses provide preliminary information on the impact of allowing students to choose multiple ethnic/racial categories. (Author/SLD)

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Defining Group Membership: The Impact of Multiple versus Single Ethnic/Racial Categories on Testing Practices

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Abstract

The SAT Program tests are designed for use with juniors and seniors in high school as part of the college admissions process. At the time of registration, students voluntarily complete the Student Descriptive Questionnaire (SDQ) that asks a variety of questions, ranging from course-taking patterns, college preferences, self-reported grades, and various family and self-indicators. One of the questions on the SDQ asks students to choose the ethnic/racial category that describes them; however, only one ethnic/racial category may be chosen.

The SAT Program undertook two studies aimed at evaluating the impact of allowing students to indicate more than one ethnic/racial category. Information was collected during two large fall administrations of the SAT I. Students were asked, immediately following testing, to indicate their ethnic/racial background on their answer sheet; multiple selections were allowed. During the first fall administration, students were asked to indicate all categories that described them using essentially the same list found on the SDQ. During the second administration, students were asked to describe themselves using a two-part question, first indicating their ethnicity (Hispanic or non-Hispanic) and second their race (using the remaining SDQ categories). Approximately 93% of test takers responded to the questions on both the answer sheet and the SDQ and about 4.5% moved from a single to multiple ethnic/racial categories. The effect of the shift from single to multiple categories was further examined by comparing differential item functioning (DIF) results using the test takers from the first administration. Results indicated that the mean DIF changed very little when the groups were redefined using their responses on the answer sheet. These analyses provide preliminary information on the impact of allowing students to choose multiple ethnic/racial categories.

The SAT Program tests (SAT I: Reasoning Test and the SAT II: Subject Tests) are designed for use with juniors and seniors in high school and scores are used to assist in the college admissions process. The Student Descriptive Questionnaire (SDQ) is the primary mechanism for gathering demographic and background information on students who take these tests. This questionnaire is voluntarily completed at the time students register to take the SAT I or SAT II and asks a variety of questions, ranging from course-taking patterns, college preferences, self-reported grades, and various family and self indicators. One of the questions on the SDQ asks students to choose the ethnic/racial category that describes them (see Table 1). However, only one ethnic/racial category may be chosen. Even though responses to the SDQ are voluntarily, most questions have a high response rate; for example, the ethnic/racial question has over a 90% response rate.

As student demographics have changed, increasing requests have been made to allow students to choose multiple ethnic/racial categories. In addition, in November 1997, the Office of Management and Budgeting issued changes to the racial and ethnic categories that allow for multiple selections. And, the Census 2000 allowed individuals, for the first time, to choose multiple racial and ethnic categories. As a result of these changes, the SAT Program decided to undertake a series of studies to examine the impact of allowing students to indicate more than one ethnic/racial category.

Sample

Data were collected information during two large fall administrations of the SAT I in 1998. Students were asked, following testing, to indicate their ethnic/racial background on their answer sheet. Multiple selections were allowed. Only those students who completed the ethnic/racial question on both the SDQ and the answer sheet were included in the analyses.

During the first fall administration, students were asked to indicate all categories that they felt described them using essentially the same list of ethnic/racial categories found on the SDQ. (Note that although "Native Hawaiian or other Pacific Islander" was listed as a separate category, it was combined with "Asian or Asian American" for analysis purposes.) During the second administration, students were asked to describe themselves using two separate questions. First, they were to indicate their ethnicity as being "Hispanic or Latino" or "Not Hispanic or Latino." Then they were to indicate their race, using all of the remaining SDQ categories that applied. Table 1 presents both sets of questions.

Results

Shifts in Categories. For all analyses, the subcategories for "Hispanic" were collapsed into one category. A total of 349,608 students (93.1% of the SAT I test takers) responded to both the SDQ and the answer sheet questions in the first administration (see Table 2). Of these students, over 83% selected the same category both times. These numbers are shaded in Table 2. White (97.0%), African American (90.7%), and Asian American (93.2%) students tended to select a single category, while Hispanic and American Indian students spread out along a number of ethnic/racial categories. This is especially apparent in the American Indian category: only 35.4% of students choosing this category on the SDQ selected the category

again on the answer while 28.1% moved from "American Indian" to "White."

Approximately 15,829 (4.5%) of the students shifted from a single category on the SDQ to more than one ethnic/racial category on the answer sheet. These numbers are presented in the bottom row of Table 2 ("Multiple"). Students who indicated they were "American Indian" or "Other" on the SDQ choose multiple categories more frequently than other groups: About 28.4% of students indicating "American Indian" choose multiple categories on the answer sheet and 28.3% of students indicating "Other" choose multiple categories on the answer sheet. While 4.5% may not seem like a large number, when taken in context of the 3 million students who take SAT Program tests each year, this percentage represents about 135,000 test takers.

A further analysis examined the percent of students that moved from single to multiple ethnic/racial categories by region. This information is presented in Table 3. For this analysis, states were grouped into regions using the College Board-defined regions. In most regions, the shift from a single category response on the SDQ to a multiple category response on the answer sheet was less than 3%. For the Southwest, just over 4% of the student choose multiple ethnic/racial categories on the answer sheet. In the West, the percent of students moving from a single category to multiple categories was the highest of all regions, 7.5%. The volume for this fall administration is very high for the Western region (mostly due to California test takers) and thus, represents a high percentage of the total number of test takers. This undoubtedly influences the total shift seen in Table 2. It is possible that in other test administrations where the percentage of test takers from the West is lower, the shift from single- to multiple-categories will be lower than 4.5%.

Test takers marked a wide variety of multiple categories and a total of 186 combinations were found. However, combinations of two ethnic/racial categories represented

74% of students marking multiple categories. Table 4 displays the most frequently occurring combinations for this testing administration. Note that "White" and another racial category encompasses a substantial number of test takers.

For the second administration, 243,820 students (92.9% of the SAT I test takers) responded to both the SDQ and the answer sheet questions (see Table 5). This set of questions appears to have caused confusion among test takers. For those students indicating they were Hispanic/Latino on both the answer sheet and the SDQ, over half of them selected "Other" as their race and about one-third selected no race category on the answer sheet. For those students indicating they were Hispanic/Latino on the answer sheet but not the SDQ, most selected the same race category on the answer sheet as they did on the SDQ. These cells are shaded in Table 5 (top table). Those students who indicated they were Hispanic on the SDQ but were not Hispanic on the answer sheet selected "Other," "White," or multiple race categories on the answer sheet. And the majority of the students who indicated they were not Hispanic on both the answer sheet and the SDQ selected the same race category on the answer sheet as they had on the SDQ. As seen in the first administration, White, African American, and Asian American students tended to select one category on the answer sheet, while American Indian students again selected a number of categories. These cells are shaded in Table 5 (bottom table).

DIF analysis. Students from the first administration were used to compare differential item functioning (DIF) for groups formed using different ethnic/racial indicators. Two focal groups were formed: "Only" includes students who choose only a single ethnic/racial category on the answer sheet (e.g., only African American); "Plus" includes any student who choose a particular ethnic/racial category on the answer sheet and at least one other category (that is, they belonged to the "Multiple" category).

Mean Mantel-Haenszel DIF differences were computed using the "Original" (i.e., the particular ethnic/racial category in which students were placed based on their SDQ response) group as the reference group and the "Only," and the "Plus" groups as focal groups. For each ethnic/racial group the difference between each item (the "Original" minus "Only" or "Original" minus "Plus") was calculated and the mean using the absolute differences computed.

Table 6 displays the differences for the items from the operational form given during the administration. As can be seen, the differences are very small, indicating that the DIF estimates are highly similar, irrespective of the particular group used. Additional analyses performed on pretest items (Table 7) produce similar results. Differences range from .01 to .14 for the operational items and from .06 to .16 for the pretest items.

These differences are quite reasonable, especially if compared to the differences seen when the same items are given to two different groups of "Original" students. For example, differences of .07 to .20 were seen in pretests that appeared in two different forms of the test at the same administration. These results are not surprising, however, in that the majority of students did not change ethnic/racial categories from the SDQ to the answer sheet. And of those students who indicated multiple categories, the majority still selected the ethnic/racial category they originally selected on the SDQ in addition to other category(ies). The ethnic/racial group showing the largest mean differences was "American Indian" and that group also displayed the greatest change in responses from SDQ to answer sheet. It should also be noted that the analyses with "American Indian" as the focal group also contained the smallest sample; the larger DIF differences may be an artifact of the small sample size.

Summary

These analyses provide preliminary information on the effect of allowing students to choose

multiple categories. While a small percentage of students across the country are likely to respond to multiple categories, the percentage of students is much larger in some regions (e.g., West, Southwest) than others. And taken in context of the number of students testing through the SAT Program, this small percentage could represent a substantial number of students.

It appears that the two-level question used in the second administration is difficult for students to use. That is, the distinction between "race" and "ethnicity" may not be clear for some students. Thus, the single question used in the first administration seems to be the preferable one.

While some recommendations can be made based on these data, it is apparent that additional work is needed to determine to full impact that changing demographics may present in current testing practices. There are also several issues that need further exploration. For example, the SDQ presents a more detailed list of categories for "Hispanic/Latino" (e.g., Mexican or Mexican American, Puerto Rican, etc.) but not for other categories, such as for "Asian or Asian American." Whether other ethnic/racial categories (e.g., "Asian or Asian American") also require a list of subcategories, and the impact of using subcategories versus a collapsed category in analyses such as DIF, should be studied further.

In addition, the characteristics of the students who use the "Other" category are still largely unknown. Over the last 5 years, the percentage of students indicating "Other" on the SDQ has risen slightly (from 2% to 3%). It was expected that a good number of these students would move from "Other" to multiple categories. While the number of students selecting "Other" was reduced when they were able to choose more than one ethnic/racial category, there were still a substantial percentage of students who used "Other" to describe themselves. These students may feel that their ethnic/racial groups are not represented by the current list of categories.

Finally, results of this study indicated that there is little impact on DIF analyses when different definitions of ethnic/racial classifications are used compared to traditionally defined classifications. Until the percentage of students representing multiple ethnic/racial categories grows, it is unlikely that current testing practices need to be modified. However, the changing demographics of these test takers should continued to be monitored and tracked to determine possible impact in the future.

Table 1. Ethnic/Racial Questions

Student Descriptive Questionnaire question:

1. How do you describe yourself? (Mark only one.)

American Indian or Alaskan Native
Asian, Asian American, or Pacific Islander
African American or Black
Hispanic or Latino background:
  Mexican or Mexican American
  Puerto Rican
  Latin American, South American, Central American, or other Hispanic or Latino
White
Other

First Administration question:

1. How do you describe yourself? Mark *all choices that apply:*

American Indian or Alaskan Native
Asian or Asian American
African American or Black
Hispanic or Latino background:
  Mexican or Mexican American
  Puerto Rican
  Latin American, South American, Central American, or other Hispanic or Latino
Native Hawaiian or other Pacific Islander
White
Other

Second Administration questions:

1. How do you describe yourself? Choose *only one:*

Hispanic or Latino
Not Hispanic or Latino

2. How do you describe yourself? Mark *all choices that apply:*

American Indian or Alaskan Native
Asian or Asian American
African American or Black
Native Hawaiian or other Pacific Islander
White
Other

Table 2. Student Responses to Ethnic/Racial Categories on SDQ and SAT I Answer Sheet (First Administration)

	SDQ Response					
Answer Sheet Response	**American Indian**	**Asian American**	**African American**	**Hispanic/ Latino**	**White**	**Other**
American Indian	736 (35.4)					
Asian American	70 (3.4)	31,696 (93.2)				506 (5.7)
African American	54 (2.6)		23,956 (90.7)			238 (2.7)
Hispanic/ Latino				21,266 (87.2)		
White	585 (28.1)			291 (1.2)	211,778 (97.0)	1,306 (14.8)
Other	32 (1.5)	480 (1.4)	265 (1.0)			4,086 (46.3)
Multiple	591 (28.4)	1,572 (4.6)	1,785 (6.8)	2,584 (10.6)	4,185 (1.9)	2,496 (28.3)

Note. Numbers in parentheses are percents. Empty cells mean less than 1% of students indicated membership in that ethnic/racial group.

Above table is based on 349,608 test takers. These students represented about 93.1% of students taking a fall 1998 SAT I who completed the Student Descriptive Questionnaire (SDQ) and the answer sheet (A/S) question about ethnicity/race.

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Table 3. Percent of Students Choosing Multiple Categories, by Region

Region	Percent of Students
New England	2.67
Middle States	2.84
South	2.90
Midwest	2.51
Southwest	4.06
West	7.51

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Table 4. Most Frequently Occurring Ethnic/Racial Combinations

Frequency	Categories
2,073	White – American Indian
1,921	White – Asian American
1,706	White – Other
1,346	White – Other Latino
1,160	White – Mexican
813	White – African American
526	White – Puerto Rican
484	American Indian – African American
412	Asian American – Other
406	Mexican – Other Latino
284	African American – Other
269	African American – Other Latino
263	Asian American – African American

Table 5. Student Responses to Ethnic/Racial Categories on SDQ and SAT I Answer Sheet (Second Administration)

Hispanic = Yes

A/S Response	SDQ Response: American Indian	Asian American	African American	Hispanic/ Latino	White	Other
American Indian	37 (42.5)					
Asian American		174 (72.2)				
African American		3 (1.2)	284 (43.4)			73 (11.2)
White	2 (2.3)	4 (1.7)	15 (2.3)	1,159 (6.9)	532 (60.2)	77 (11.8)
Other	10 (11.5)	11 (4.6)	160 (24.4)	8,968 (53.5)	79 (8.9)	176 (27.0)
Multiple	33 (37.9)	45 (18.7)	105 (16.0)	1,239 (7.4)	200 (22.6)	249 (38.2)
None	5 (5.7)	4 (1.7)	84 (12.8)	2,137 (30.8)	45 (5.1)	42 (6.4)

Note. Numbers in parentheses are percents. Empty cells mean less than 1% of students indicated membership in that ethnic/racial group.

Hispanic = No

A/S Response	SDQ Response: American Indian	Asian American	African American	Hispanic/ Latino	White	Other
American Indian	414 (33.5)					
Asian American	35 (2.8)	14,423 (90.2)		19 (3.8)		257 (5.0)
African American	48 (3.9)		17,492 (90.6)	53 (10.7)		244 (4.8)
White	344 (27.8)			171 (34.4)	120,318 (96.4)	819 (16.0)
Other	21 (1.7)	339 (2.1)	236 (1.2)	188 (37.8)		2,353 (46.1)
Multiple	374 (30.2)	1,005 (6.3)	1,407 (7.3)	54 (10.9)	2,936 (2.4)	1,381 (27.1)
None				9 (1.8)		

Note. Numbers in parentheses are percents. Empty cells mean less than 1% of students indicated membership in that ethnic/racial group.

Table 6. Mean Mantel-Haenszel D-DIF Differences for Operational Items

Comparison	Group	Verbal (# items = 78)	Math (# items = 60)
African American/White	Only	.01	.02
	Plus	.02	.02
Hispanic/White	Only	.03	.03
	Plus	.03	.03
Asian American/White	Only	.02	.03
	Plus	.03	.05
American Indian/White	Only	.14	.14
	Plus	.14	.12

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Table 7. Mean Mantel-Haenszel D-DIF Differences for Pretest Items

Pretest	African American/ White		Hispanic/ White		Asian American/ White	
	Only	Plus	Only	Plus	Only	Plus
Verbal						
1 (# of items = 35)	.06	.07	.11	.08	.08	.09
2 (# of items = 35)	.07	.07	.09	.12	.10	.10
3 (# of items = 35)	.11	.10	.13	.12	.10	.10
4 (# of items = 35)	.07	.07	.14	.11	.08	.09
5 (# of items = 35)	.08	.08	.11	.10	.07	.09
6 (# of items = 35)	.07	.08	.13	.12	.07	.10
7 (# of items = 30)	.09	.07	.16	.12	.14	.15
8 (# of items = 30)	.10	.09	.14	.13	.12	.12
9 (# of items = 35)	.06	.07	.10	.08	.08	.07
10 (# of items = 30)	.07	.07	.12	.12	.08	.09
11 (# of items = 30)	.08	.07	.10	.08	.06	.05
12 (# of items = 30)	.09	.07	.09	.08	.08	.08
Math						
1 (# of items = 25)	.09	.07	.12	.12	.13	.12
2 (# of items = 25)	.11	.06	.16	.11	.10	.11
3 (# of items = 25)	.06	.06	.08	.07	.12	.11
4 (# of items = 25)	.16	.09	.14	.14	.09	.12
5 (# of items = 25)	.06	.05	.14	.13	.12	.10
6 (# of items = 25)	.10	.10	.13	.15	.10	.11

Note. Sample sizes too small to perform "American Indian" analyses.

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